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Attorney's Docket No. 000500-196

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Eva Simmons et al.

Application No.: 09/380,208

Filed: November 8, 1999

For: Absorbent Article That Includes a Liquid  
Barrier with Improved Sealing

) MAIL STOP APPEAL BRIEF –  
) PATENTS

) Group Art Unit: 3761

) Examiner: Michele M. Kidwell

) Confirmation No.: 2331

BRIEF FOR APPELLANT TRANSMITTAL LETTER

**Mail Stop-APPEAL BRIEF – PATENTS**

Commissioner for Patents

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Enclosed is the Brief for Appellant for the above-identified patent application.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.16, 1.17, 1.20(d) and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. This paper is submitted in triplicate.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: Mary B. Grant  
Mary B. Grant  
Registration No. 32,176

P.O. Box 1404  
Alexandria, Virginia 22313-1404  
(919) 941-9240

Date: May 3, 2004

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Simmons, Eva et. al.

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This appeal is from the decision of the Examiner dated December 2, 2003, finally rejecting claims 15-42, which are reproduced as an Appendix to this brief.

Charge the ☐ \$165.00 (2402) ☒ \$330.00 (1402) Government fee to Deposit Account 02-4800. Two extra copies of this brief are being filed herewith.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800. A copy of this page and the signature page are submitted in triplicate.

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**I. Real Party in Interest**

The present application is assigned to SCA Hygiene Products AB of Göteborg, Sweden.

**II. Related Appeals and Interferences**

The Appellants, Appellants' legal representative, or assignee, does not know of any other appeal or interferences which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

**III. Status of Claims**

Claims 15-42 are pending and on appeal in the application. Claims 1-14 were canceled in a Preliminary Amendment filed August 26, 1999. Claims 15-42 were first presented in the Preliminary Amendment filed August 26, 1999.

Pursuant to 37 C.F.R. § 1.191(a), Applicants hereby appeal the Examiner's decision finally rejecting claims 15-42 to the Board of Patent Appeals and Interferences.

**IV. Status of Amendments**

A final Official Action was issued on December 2, 2003, rejecting claims 15-42 under 35 U.S.C. §§ 102 and 103. A Notice of Appeal was filed March 1, 2004.

No amendments were made to the claims after the final rejection. The claims were last amended in the Amendment submitted September 23, 2003. A copy of the claims at issue on appeal is attached as Appendix A.

**V. Summary of the Invention<sup>1</sup>**

The present invention in one embodiment relates to a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer. (See, for example, page 1, lines 4-6). The improved sealing ability is achieved at a given available elongation, (See, for example, page 7, lines 1-18) by at least one sealing edge on each side of the center line, comprising modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta_m / r$  for the sealing edge to increase, where  $\gamma$  designates the surface tension of a liquid to be absorbed by suction,  $r$  designates the radius of the largest circle that can be encompassed in any pore with walls formed by the sealing edge against the wearer's skin at the given available elongation, and  $\cos\theta_m$  is the weighted mean value of  $\cos\theta$ , where  $\theta$  is the wetting angle of the liquid to the sealing edge or the skin comprising the pore walls. (See, for example, page 9, line 18 – page 10, line 2).

The method is achieved in an absorbent article that includes (1) an absorbent body disposed between a liquid-impermeable bottom sheet which is intended to lie distal from a wearer in use, (2) a liquid-permeable upper sheet which is intended to lie proximal to the wearer, (See, for example, page 1, lines 9-12) and (3) either a) at least one longitudinally extending liquid barrier on each side of a center line of the upper sheet made of essentially liquid-impervious material and fastened along or adjacent to a respective longitudinally extending side extremity of the absorbent article and comprising a free elastic sealing edge intended to be stretched against the wearer, (See, for example, original claim 1) or b) above the upper sheet, a top liquid-impermeable sheet which is intended to lie against the wearer, includes elastic for shaping the article to the wearer's body, and includes apertures intended to lie in register with the anus and the urethra orifice of the wearer, around which apertures elastically puckered sealing edges are disposed in the top sheet (See, for example, original claim 1).

The present invention in another embodiment defines an absorbent article that includes an absorbent body disposed between a liquid-impermeable bottom

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<sup>1</sup> This summary is provided in accordance with 37 C.F.R. §1.192(c)(5) and is not intended to limit the subject matter of the claimed invention to the specific embodiments described herein.

sheet which is intended to lie distal from a wearer in use, a liquid-permeable upper sheet which is intended to lie proximal to the wearer, and either 1) at least one longitudinally extending liquid barrier on each side of a center line of the upper sheet, made of essentially liquid-impervious material and fastened along or adjacent to a respective longitudinally extending side extremity of the article and including a free elastic sealing edge intended to be stretched against the wearer, or 2) above the upper sheet, a liquid-impermeable top sheet which is intended to lie against the wearer, includes elastic for shaping the article to the wearer's body, and includes apertures intended to lie in register with the anus and the urethra orifice of the wearer, around which apertures elastically puckered sealing edges are disposed in the top sheet. (*See, for example, original claim 1, pages 2-3*).

As to the absorbent article, in respect of at least one sealing edge on each side of the center line of said absorbent body, the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ , where  $x$  designates the available elongation of the sealing edge,  $k$  has the value  $-14/30$  and  $m$  has a value in the range of 48 to 69, within the major part of an available elongation range of between 20 and 40%, and where  $\gamma$  designates the surface tension of a liquid to be absorbed,  $r$  designates the radius of the largest circle that can be enclosed in any pore with walls formed by said sealing edge against the skin of the wearer at a given available elongation, and  $\cos\theta m$  is the weighted value of  $\cos\theta$ , where  $\theta$  is the wetting angle of the liquid to the sealing edge or the skin comprising the pore walls. (*See, for example, page 13, line 26 – page 14, line 10*).

## **VI. The Issues**

The issues presented on appeal are:

(1) Whether claims 15, 25-36 and 40-42 are properly rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Roe (U.S. Patent No. 5,607,760).

(2) Whether claims 16-24 and 37-39 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Roe (U.S. Patent No. 5,607,760).

## **VII. Grouping of Claims**

The claims do not stand or fall together. For each rejection, each of independent claims 15 and 29 stand or fall individually. Independent claim 15 stands alone for reasons set forth in the Argument section, particularly in sections VIII.C.1.(a) and VIII.C.2.(a). Claims 16-28, which are dependent directly or indirectly on claim 15, each include at least one additional feature which is believed to make the inventions defined in each of these claims separately patentable. Thus, for each rejection, each of claims 16-28 stand or fall individually for reasons further detailed below at least in sections VIII.C.1.(b)-(e), VIII.C.2.(b)-(e) and VIII.D.1-3.

For each rejection, independent claim 29 stands or falls individually and includes additional patentably distinct features that make the claim separately patentable as explained in the Argument section, particularly in sections VIII.C.1.(f) and VIII.C.2.(f). Dependent claims 30-42, dependent either directly or indirectly on claim 29, stand or fall individually for each rejection as each includes at least one additional patentably distinct feature that makes each claim separately patentable as discussed in at least sections VIII.C.1.(g)-(k), VIII.C.2.(g)-(k) and VIII.D.4.

## **VIII. Argument**

### **A. The Invention**

The present invention relates to absorbent articles, such as diapers or incontinence guards, that provide a better sealing effect against the wearer's skin than earlier known articles of this kind. *Page 1, lines 4-7*. Problems with previously known absorbent articles occur in the event of rapid liquid discharges where a large volume of liquid must pass first through the top liquid-permeable sheet and then be absorbed by and dispersed in the absorbent body. This absorption takes a certain period of time during which liquid will run out to the edges of the article and leak therefrom. *Page 1, lines 23-28*. This problem has been addressed previously by the use of liquid barriers or inner cuffs or side-flaps that are intended to resist liquid leakage in the event of rapid liquid discharges. However, sometimes the liquid will rise above the brim of the barriers and leak out when the volume of liquid discharged is excessive or when the wearer sits or lies down. *Page 2, lines 15-17*.



Through the study of various liquid barriers, the leakage tendency with the elastic element of the liquid barriers has been measured. It thus appears that the sealing effect is influenced by other factors than solely the tension in the elastic material. On the basis of the theory that leakage does not occur merely because the elastic in the barrier material releases its contact with the wearer's skin but first occurs through the through-penetrating pores or channels that are formed between the wearer's skin and the folds in the puckered edge of the barrier material, endeavors have been made to create a model from which the leakage pressure can be determined theoretically and thereby become aware of those parameters that shall be influenced in order to achieve a better sealing effect. *Page 8, line 21 – page 9, line 13.*

As explained in the specification, the capillary pressure of the pores in porous structures can be calculated with the Laplace equation which provides that the capillary pressure is  $\Delta P = 2\gamma \cos\theta/r$  where  $\gamma$  is the surface tension of the liquid,  $\theta$  is the wetting angle of the liquid to the material in the capillary walls, and  $r$  is the radius of the capillary. When  $\theta$  is greater than  $90^\circ$ ,  $\cos\theta$  is negative and  $\Delta P$  is consequently also negative. The capillary wall is hydrophobic and the resultant pressure  $\Delta P$  can be said to describe the breakthrough pressure, i.e., the maximum pressure a capillary or pore can withstand. When  $\theta$  is less than  $90^\circ$ , the capillary wall is hydrophilic and  $\Delta P$  and  $\cos\theta$  are positive. Liquid is then sucked into the pores. *Page 9, lines 15-25.*

As described in the specification, from an understanding of the foregoing and the additional material in the specification, it has been found possible to improve the sealing effect of the liquid barrier in an absorbent article against the wearer's skin by influencing  $|\Delta P|$ , i.e.,  $|2\gamma \cos\theta m/r|$ , of the barrier so that this value increases. *Page 12, lines 24-27.*

$|\Delta P|$  can be caused to increase by increasing the product  $|2\gamma \cos\theta m/r|$ . The product can be increased by, for instance, influencing the wetting angle between the liquid to be sucked up and the skin or the barrier material, respectively; influencing the pore radius formed between the barrier material and the skin; and influencing both wetting angle and pore radius. *Page 13, lines 10-15.*

Accordingly, an improved sealing ability against the skin of the wearer may be achieved by modifying or treating the absorbent article in such a way as to cause the

absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for a sealing edge to increase. An absorbent article having improved sealing properties against a user may be provided by ensuring that the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ , wherein  $x$  designates the available elongation of the sealing edge,  $k$  has the value  $-14/30$  and  $m$  has a value in the range of 48 to 69.

## **B. The Cited Art**

Roe discloses a disposable absorbent article having a lotion coating on the outer surface of the topsheet that is semisolid or solid at ambient temperatures (i.e., at 20°C) and is adapted to be transferred to the wearer's skin, where it acts to reduce the adherence of BM to the skin of the wearer, thereby improving the ease of BM clean up and enhancing skin softness. *Column 3, lines 1-9.*

The lotion compositions of Roe comprise: (1) an emollient to improve the lubricity of the solid polyol polyester(s); (2) a solid polyol polyester(s) immobilizing agent; (3) optionally a hydrophilic surfactant(s); and (4) other optional components. *Column 10, lines 34-38.* Emollients taught as useful in Roe can be petroleum-based, fatty acid ester type, alkyl ethoxylate type, fatty acid ester ethoxylates, fatty alcohol type, polysiloxane type, or mixtures of these emollients. Suitable petroleum-based emollients include those hydrocarbons, or mixtures of hydrocarbons, having chain lengths of from 16 to 32 carbon atoms. Petroleum based hydrocarbons having these chain lengths include mineral oil (also known as "liquid petrolatum") and petrolatum (also known as "mineral wax," "petroleum jelly" and "mineral jelly"). Petrolatum and mineral oil are particularly preferred emollients for lotion compositions in Roe. *Column 15, lines 47-61.* The lotion composition can comprise from about 5 to about 95% of the emollient. *Column 17, lines 61-62.*

The lotion of Roe further contains a solid polyol polyester immobilizing agent. The immobilizing agent is a key component of the lotion compositions of Roe. *Column 17, lines 66-67.* The solid polyol polyester described is capable of immobilizing the emollient on the diaper topsheet to which the lotion composition is applied. *Column 18, lines 1-2.* The immobilizing agent counteracts the tendency of the emollient to migrate or flow by keeping the emollient primarily localized on the surface of the diaper topsheet to which the lotion composition is applied. *Column 18, lines 21-24.*

According to Roe, it is highly desirable that the diaper topsheet is made of a hydrophilic material to promote rapid transfer of liquids (e.g., urine) through the topsheet. *Column 21, lines 40-42*. Similarly, according to Roe, it is important that the lotion composition also be sufficiently wettable to ensure that liquids will transfer through the topsheet more rapidly. *Column 21, lines 42-45*. Thus, depending upon the particular immobilizing agent used in the lotion composition of Roe, an additional hydrophilic surfactant, or a mixture of hydrophilic surfactants may be used to improve wettability. *Column 21, lines 40-52*. As described in Roe, some immobilizing agents, such as N-cocoyl-N-methoxypropyl glucamide have HLB values of at least about 7 and are sufficiently wettable without the addition of hydrophilic surfactant. Other immobilizing agents such as the C<sub>16</sub>-C<sub>18</sub> fatty alcohols having HLB values below about 7 will require addition of hydrophilic surfactant to improve wettability when the lotion composition is applied to diaper topsheets. Similarly, Roe teaches that a hydrophobic emollient such as petrolatum will require the addition of a hydrophilic surfactant. *Column 21, lines 52-61*.

The amount of hydrophilic surfactant required to increase the wettability of the lotion composition to a desired level will depend upon the HLB value and level of immobilizing agent used, the HLB value of the surfactant used and like factors. The lotion composition can comprise from about 1 to about 50% of the hydrophilic surfactant when needed to increase the wettability properties of the composition. *Column 23, lines 14-20*.

Roe primarily describes the lotion as used on the topsheet. In other alternate embodiments, the lotion composition may be applied to the inner surface of the diaper topsheet and/or to a layer disposed underneath the topsheet. In still other embodiments, the lotion may be applied to any part of the diaper wherein it can come in contact with the wearer's skin. For example, leg cuffs are areas to which the lotion compositions of Roe can be applied. *Column 25, lines 19-31*.

**C. The Rejection of Claims 15, 25-36 and 40-42 under 35 U.S.C. § 102(e) as Anticipated By or, in the Alternative, under 35 U.S.C. § 103(a) as Obvious over Roe, U.S. Patent No. 5,607,760, is Improper**

**1. Claims 15, 25-36 and 40-42 Are Not Anticipated Under 35 U.S.C. § 102(e) by Roe**

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *MPEP § 2131, citing Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

**(a) Claim 15**

Roe does not disclose each and every element of claim 15 and, thus, claim 15 is not anticipated thereby. There are several features in claim 15 that are not described anywhere in Roe. Roe does not disclose at least (1) a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer, or (2) modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta_m/r$  for a sealing edge to increase.

Roe is directed to an absorbent article having a lotion coating which acts to reduce the adherence of BM to the skin of the wearer, thereby improving the ease of BM clean up and enhancing skin softness. Roe does not disclose a feature wherein the absorbent article includes an improved sealing ability. Roe primarily discusses the application of a particular lotion to the topsheet of an absorbent article and merely mentions in passing placing such lotion on other portions of the absorbent article. The focus of Roe on prevention of BM adherence is continuous throughout the patent and no discussion of leakage prevention or sealing ability is presented.

With reference to claim 15, the Office Action states:

...Roe discloses a method of achieving in an absorbent article that includes an absorbent body disposed between a liquid-impermeable bottom sheet which is intended to lie distal from a wearer in use, a liquid-permeable upper sheet which is intended to lie proximal to the wearer, and at least one longitudinally extending liquid barrier on each side of a center line of the upper sheet made of essentially liquid-impervious material and fastened along or adjacent to a respective longitudinally extending side extremity of the absorbent article and

comprising a free elastic sealing edge intended to be stretched against the wearer as set forth in col. 6, lines 38-53, col. 8, lines 50-56, col. 15, lines 53-56 and col. 25, lines 26-32.

*Office Action mailed December 2, 2003, page 2.*

The first section of Roe referred to in the Office Action describes the diaper of Roe as follows:

FIG. 3 is a plan view of the diaper 50 of the present invention in its flat-out, uncontracted state (i.e., with elastic induced contraction pulled out) with portions of the structure being cut-away to more clearly show the construction of the diaper 50 and with the portion of the diaper 50 which faces away from the wearer, the outer surface, oriented towards the viewer. As shown in FIG. 3, the diaper 50 preferably comprises a liquid pervious topsheet 520; a liquid impervious backsheet 530 joined with the topsheet 520; an absorbent core 540 positioned between the topsheet 520 and the backsheet 530, the absorbent core 540 having a garment facing surface 542, a body facing surface 544, side edges 546, waist edges 548, and ears 549. The diaper 50 preferably further comprises elasticized leg cuffs 550; an elastic waist feature multiply designated as 560; and a fastening system generally multiply designated as 570.

*Column 6, lines 38-53.* This section of Roe does not disclose either a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer, or modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for a sealing edge to increase.

The second cited section of Roe describes leg cuffs for diapers generally, citing various documents which describe such leg cuffs. This section of Roe does not disclose a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer, or modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for a sealing edge to increase.

The third cited section of Roe is a portion of the section on emollients for use in the lotion as described:

Petroleum based hydrocarbons having these chain lengths include mineral oil (also known as "liquid petrolatum") and petrolatum (also known as "mineral wax," "petroleum jelly" and "mineral jelly").

*Column 15, lines 53-56.* This section does not disclose a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer, or modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for a sealing edge to increase.

The Examples of Appellants' specification illustrate the use of Vaseline, a petroleum jelly product, as one method of increasing the wetting angle of the liquid to skin. The uppermost curve in Fig. 6a shows measurements obtained with a liquid barrier that had been treated with Vaseline. Vaseline has a wetting angle of 100°. The Vaseline partially blocks the pores, i.e., reduces the pore radius, and also smears the wearer's skin, thereby increasing the wetting angle of the liquid to the skin. *Page 15, lines 25-28.*

Roe, in contrast, does not disclose the use of a petrolatum material alone or to improve sealing ability or to modify or treat the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for a sealing edge to increase. Rather, petrolatum as disclosed by Roe may be used as an emollient in an overall lotion composition, which includes a solid polyol polyester immobilizing agent and optional hydrophilic surfactant as required to increase wettability to a desired level. *Column 23, lines 14-20.* The amount of lotion composition preferably applied to the diaper topsheets as disclosed in Roe is an amount ranging from about 0.1 mg/in<sup>2</sup> to about 25 mg/in<sup>2</sup> (0.16 - 38.8 g/m<sup>2</sup>). *Column 24, lines 1-4.* This amount would not be enough, if added to a leg cuff, to decrease the pore size and increase the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$ . Thus, the wettable lotion described in Roe would not reduce pore radius, increase the wetting angle of the liquid to the skin as shown in Appellants' examples or cause the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for a sealing edge to increase so as to improve sealing ability.

The fourth section of Roe relied on by the Examiner refers generally to alternate embodiments:

In still other embodiments, the lotion may be applied to any part of the diaper wherein it can come in contact with the wearer's skin. For example, leg cuffs are areas the lotion compositions of the present invention can be applied (e.g., elasticized inner, standing cuffs or elasticized outer gasketing cuffs as hereinbefore described in a disposable diaper product).

*Column 25, lines 25-32.* This section mentions other portions of a diaper besides the topsheet upon which the lotion may be placed. Roe does not disclose altering the characteristics of the lotion when it is used on a portion of the diaper such as leg cuffs.

None of the cited sections of Roe discloses a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer.

Additionally, none of the cited sections of Roe discloses modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta_m/r$  for a sealing edge to increase.

For at least the foregoing reasons and, as the Office Action in its rejection fails to show each and every element of the claimed invention, Roe fails to anticipate the invention defined in claim 15. Thus, it is respectfully requested that the Board reverse this rejection of claim 15.

**(b) Claim 25**

Claim 25 is directed to the method according to claim 15 comprising causing the absolute value of  $\cos\theta_m$  to increase. The Office Action of December 2, 2003, does not specifically cite portions of the cited art which set forth each element of claim 25. Rather, the Examiner cites only to the rejection of claim 15. Claim 25 is separately patentable and further includes an additional feature which distinguishes over Roe.

Roe does not disclose each and every element of claim 25. Roe lacks disclosure of at least (1) a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer, (2) modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta_m/r$  for a sealing edge to increase and (3) causing the absolute value of  $\cos\theta_m$  to increase.

The present invention involves a method of improving the sealing ability of an absorbent article by causing the product  $2\gamma \cos\theta_m/r$  of one or more of the liquid barriers of the article to increase. *Page 13, lines 6-8*. The product can be increased by, for instance, influencing the wetting angle between the liquid to be sucked up and the skin or the barrier material, respectively; influencing the pore radius; and influencing both wetting angle and pore radius. *Page 13, lines 10-15*. Because the effect intended is to increase the absolute value of the product  $2\gamma \cos\theta_m/r$ ,  $|\cos\theta_m|$  may be increased to obtain the desired effect. *Page 13, lines 17-20*.

Roe is directed to solving the problem of reducing the adherence of BM to the skin of the wearer. Roe does not disclose a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer,

modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta_m / r$  for a sealing edge to increase and improving the sealing ability by causing the absolute value of  $|\cos\theta_m|$  to increase. Since each and every element of the claimed invention is not found in Roe, the subject matter of claim 25 is not anticipated by Roe. Accordingly, it is respectfully requested that the Board reverse this rejection of claim 25.

**(c) Claim 26**

Claim 26 is directed to the method according to claim 25, comprising treating the sealing edge such that a higher wetting angle of the liquid to the sealing edge comprising the pore wall will be obtained and/or such that a higher wetting angle of the liquid to the skin of the wearer will be obtained within those regions in which the sealing edge lies against the skin when the absorbent article is donned.

The Office Action of December 2, 2003, does not specifically cite portions of the cited art which set forth each element of claim 26. Rather, the Examiner cites only to the rejection of claim 15. Claim 26 is separately patentable and further includes an additional feature which distinguishes over Roe.

Roe does not disclose each and every element of claim 26. Roe lacks disclosure of at least (1) a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer, (2) modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta_m / r$  for a sealing edge to increase, (3) causing the absolute value of  $\cos\theta_m$  to increase and (4) treating the sealing edge such that a higher wetting angle of the liquid to the sealing edge comprising the pore wall will be obtained and/or such that a higher wetting angle of the liquid to the skin of the wearer will be obtained within those regions in which the sealing edge lies against the skin when the absorbent article is donned.

The subject matter of claim 26 relates to treating the sealing edge such that a higher wetting angle will be obtained within those regions in which the sealing edge lies against the skin when the absorbent article is donned. Roe does not disclose obtaining any particular wetting angle or treating a sealing



edge to affect a wetting angle. Rather, Roe is directed to a lotion composition which reduces the adherence of BM to the skin of the wearer wherein the lotion composition must have certain wettability. Such a wettable composition would decrease, rather than increase the wetting angle of liquid to skin. In view thereof, Roe does not disclose each feature of claim 26 and does not anticipate the invention as defined therein. Accordingly, it is respectfully requested that the Board reverse this rejection of claim 26.

**(d) Claim 27**

Claim 27 defines a method according to claim 15, comprising providing the sealing edge with a layer of material that increases the absolute value of  $\cos\theta_m$  and/or that reduces  $r$  when the article is donned.

The Office Action of December 2, 2003, does not specifically cite portions of the cited art which set forth each element of claim 27. Rather, the Examiner cites only to the rejection of claim 15. Claim 27 is separately patentable and further includes an additional feature which distinguishes over Roe.

Roe does not disclose each and every element of claim 27. Roe lacks disclosure of at least (1) a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer, (2) modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta_m / r$  for a sealing edge to increase and (3) providing the sealing edge with a layer of material that increases the absolute value of  $\cos\theta_m$  and/or that reduces  $r$  when the article is donned.

The subject matter of claim 27 relates to providing the sealing edge with a layer of a material that increases the absolute value of  $\cos\theta_m$  and/or that reduces  $r$  when the article is donned. As described in the specification, because the effect intended is to increase the absolute value of the product  $2\gamma \cos\theta_m / r$ , it is not necessary to unilaterally increase  $|\cos\theta_m|$  or decrease  $r$ . It is possible for a procedure of increasing  $|\cos\theta_m / r|$  to also involve simultaneous increase of the radius. Provided that the increase in  $|\cos\theta_m|$  is proportionally greater than the increase in radius, an improved result will be obtained despite the increase in radius. Similarly, a procedure that decreases

the radius may result in a decrease in  $|\cos\theta_m|$ . An improved result will still be achieved, however, provided that this latter decrease is proportionally smaller than the decrease in radius. *Page 13, lines 17-24.*

Roe does not disclose increasing the absolute value of  $\cos\theta_m$  and/or reducing  $r$  when the article is donned or the effect obtained by doing so. Rather, Roe is directed to a lotion composition which reduces the adherence of BM to the skin of the wearer. Although Roe mentions that the lotion composition may be placed on leg cuffs, Roe does not describe placing a layer of material on a "sealing edge" and does not require that the layer of material increase the absolute value of  $\cos\theta_m$  and/or reduce  $r$ . The lotion of Roe, as described, is formulated to include a hydrophilic surfactant to increase the wettability of the lotion composition. The wettability is necessary according to Roe to promote rapid transfer of liquids. Such a lotion composition would not increase the absolute value of  $\cos\theta_m$  and/or reduce  $r$  as defined in claim 27. In view thereof, Roe does not disclose each feature of claim 27 and does not anticipate the invention as defined therein. Accordingly, it is respectfully requested that the Board reverse this rejection of claim 27.

**(e) Claim 28**

Claim 28 relates to the method according to claim 15 comprising causing the absolute value of  $\cos\theta_m/r$  to increase.

The Office Action of December 2, 2003, does not specifically cite portions of the cited art which set forth each element of claim 28. Rather, the Examiner cites only to the rejection of claim 15. Claim 28 is separately patentable and further includes an additional feature which distinguishes over Roe.

Roe does not disclose each and every element of claim 28. Roe lacks disclosure of at least (1) a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer, (2) modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta_m/r$  for a sealing edge to increase and (3) causing the absolute value of  $\cos\theta_m/r$  to increase.

The subject matter of claim 28 relates to causing the absolute value of  $\cos\theta m/r$  to increase. As described above and in the specification, the sealing properties of an absorbent article may be improved by this method. Roe does not disclose increasing the absolute value of  $\cos\theta m/r$  or affecting the sealing ability of an absorbent article. Rather, Roe is directed to a lotion composition which reduces the adherence of BM to the skin of the wearer. Although Roe mentions that the lotion composition may be placed on leg cuffs, the lotion of Roe, as described, is formulated to include a hydrophilic surfactant to increase the wettability of the lotion composition. Such lotion composition would not increase the absolute value of  $\cos\theta m/r$  as defined in claim 28. In view thereof, Roe does not disclose each feature of claim 28 and does not anticipate the invention as defined therein. Accordingly, it is respectfully requested that the Board reverse this rejection of claim 28.

**(f) Claim 29**

Roe does not disclose each and every element of claim 29 and, thus, claim 29 is not anticipated thereby. There are several features in claim 29 that are not described anywhere in Roe. Roe does not disclose at least (1) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$  or (2) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$  within the major part of an available elongation range of between 20 and 40%.

The Office Action of December 2, 2003, cites the same sections of Roe against claims 29-34 and 41-42 as were cited against claim 15, and essentially repeats the rejection against claim 15 except that the Examiner alleges that Roe discloses the absorbent article of claim 29 rather than a method as defined by claim 15. The Office Action again cites column 6, lines 38-53 and column 8, lines 50-56.

As described in the specification, an absorbent article with improved sealing properties against a user has been produced such that in the case of the liquid barriers of the article, the absolute value of the product  $2\gamma \cos\theta m/r$  will be higher than that obtained when using earlier known absorbent articles. More specifically, during the greater part of the interval 20-40% available

elongation or stretch the absolute value  $y$  of the product  $2\gamma \cos\theta m/r$  will lie above line  $y = kx + m$ , where  $x$  designates the available elongation or stretch,  $k$  has the value  $-14/30$  and  $m$  has the value 48. This line is shown in Fig. 5c. *Page 13, line 26 – page 14, line 7.*

The entirety of the Roe patent deals with the problem of the adherence of BM to the skin of the wearer and providing lotion materials therefor. No disclosure of an absorbent article with the claimed characteristics is disclosed. Various lotions are described, each of which contain an emollient, a solid polyol polyester immobilizing agent and optionally a hydrophilic surfactant. No disclosure of determining absolute value as defined in claim 29 is disclosed for obtaining an absorbent article.

In view of the foregoing, the absorbent article of Roe clearly lacks the features defined in rejected claim 29. Roe does not acknowledge a problem with leakage or provide for particular characteristics for the sealing edge as defined in claim 29. Claim 29 recites that the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ . This requirement results in an absorbent article with improved sealing properties against a user. There is no teaching in Roe that characteristics of the at least one sealing edge should be configured such that it meets the recitations set forth in claim 29. In view thereof, Roe does not anticipate claim 29. Accordingly, it is respectfully requested that the Board reverse this rejection of claim 29.

**(g) Claims 30-34**

Claims 30-34 are directed to the article according to claim 29 wherein  $m$  equals 48, 51, 57, 63 or 69. The Office Action does not cite additional portions of Roe against claims 30-34. Claims 30-34 are separately patentable and each further includes at least one additional feature which distinguishes over Roe.

There are several features in claims 30-34 that are not described in Roe. Roe does not disclose at least (1) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ , (2) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$  within the major part of an available elongation range of

between 20 and 40% and (3) an article wherein  $m$  is 48, 51, 57, 63 or 69, respectively.

Claims 30-34 involve control of parameters involved with capillary function thus producing an absorbent article as claimed. Claims 30-34 are each directed to preferred parameters for such an article. Roe does not disclose an absorbent article with properties as defined in claims 30-34 which provide the improvement in breakthrough pressure illustrated in Figure 5c. As described in the specification, the sealing effect of an article having a liquid barrier where the absolute value of the negative product  $2\gamma \cos\theta m/r$  lies above the line  $y = kx + m$  at least within the major part of an available elongation range of 20-40%, where  $x$  designates the available elongation or stretch,  $k$  has the value  $-14/30$  and  $m$  has the value 48, preferably 51, more preferably 57, and even more preferably 63 and particularly 69, will be substantially better than the sealing effect achieved with conventional articles of this nature. *Specification, page 16, lines 13-19.*

Roe is completely lacking in any teaching regarding the equation of claim 29 or the variables for  $m$  as claimed in claims 30-34. In view thereof, Roe does not anticipate claims 30-34. Accordingly, it is respectfully requested that the Board reverse this rejection of claims 30-34.

**(h) Claim 35**

Claim 35 is directed to the article according to claim 29 wherein the free sealing edge includes a layer of a material such that a higher wetting angle of the liquid to the sealing edge material will be obtained and/or such that a higher wetting angle of the liquid to the skin of the wearer will be obtained within those regions in which the sealing edge lies against the skin and where the material smears the skin when the absorbent article is donned.

The Office Action of December 2, 2003, refers to column 8, lines 50-56, column 15, lines 53-56, and column 25, lines 26-32, all of which were cited above against independent claims 15 and 29. None of the sections cited in the Office Action describe the features of claim 35. Claim 35 is separately patentable and further includes at least one additional feature which distinguishes over Roe.

Roe does not disclose each and every element of claim 35. Roe does not disclose at least (1) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ , (2) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$  within the major part of an available elongation range of between 20 and 40%, or (3) a free sealing edge which includes a layer of a material such that a higher wetting angle of the liquid to the sealing edge material will be obtained and/or such that a higher wetting angle of the liquid to the skin of the wearer will be obtained within those regions in which the sealing edge lies against the skin and where the material smears the skin when the absorbent article is donned.

Roe is directed to a lotion composition which reduces the adherence of BM to the skin of the wearer. Roe describes a variety of lotion materials and discusses repeatedly the need for maintaining the hydrophilicity of the topsheet and the need for a hydrophilic surfactant to increase the wettability of the lotion. Roe does not disclose obtaining a particular wetting angle or including a layer of a material on the free sealing edge to obtain a higher wetting angle. Indeed, the wettable lotion of Roe would not increase the wetting angle. In view thereof, Roe does not disclose each feature of claim 35 and does not anticipate the invention as defined therein. Accordingly, it is respectfully requested that the Board reverse this rejection of claim 35.

(i) **Claim 36**

Claim 36 is dependent on claim 29 and defines an article wherein the free elastic sealing edge is provided with a layer of a material which at least partly fills out the pores in the free sealing edge when the article is donned.

The Office Action cites the same sections for claim 36 as for 35. As with claim 35, nothing in these sections discloses the subject matter defined in claim 36. Claim 36 is separately patentable and further includes additional features which patentably distinguish over Roe. There are several features in claim 36 that are not described anywhere in Roe. Roe does not disclose at least (1) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ , (2) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$  within the major part of

an available elongation range of between 20 and 40%, or (3) that the free elastic sealing edge is provided with a layer of a material which at least partly fills out the pores in the free sealing edge when the article is donned.

Roe mentions that the lotion described may be applied to any part of the diaper wherein it can come in contact with the wearer's skin. For example, leg cuffs are areas to which the lotion composition of the present invention may be applied. However, Roe does not include any feature wherein a free elastic sealing edge is provided with a layer of a material which at least partly fills out the pores in the free sealing edge when the article is donned. The lotion composition of Roe may be applied to a leg cuff as described, but Roe does not disclose providing a material specifically on the elastic sealing edge or providing enough of a layer of a material which at least partly fills out the pores as claimed. The purpose of adding a lotion as described in Roe is to ensure that the pores through the topsheet are not clogged, or decreased in size. The pores in the topsheet are very small pores, formed between the fibers in the material. The pores between the user and the sealing edge are large compared with the pores in the topsheet. If the pores between the skin of the user and the cuffs were to decrease at all by use of the lotion taught by Roe, the decrease would be negligible, not enough to fill out the pores. In view thereof, Roe does not disclose each feature of claim 36 and does not anticipate the invention as defined therein. Accordingly, it is respectfully requested that the Board reverse this rejection of claim 36.

**(j) Claim 40**

Claim 40 is dependent on claim 29 and defines an article wherein the free elastic sealing edge is comprised of a ribbon-like elastic film.

According to the Office Action, as to claim 40, Roe discloses an article wherein the sealing edge is comprised of a ribbon-like elastic film in column 8, lines 50-56, through the incorporation of Dragoo, U.S. Patent No. 4,795,454. However, there are several features in claim 40 that are not described anywhere in Roe. Roe does not disclose at least (1) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ , (2)

an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$  within the major part of an available elongation range of between 20 and 40%, or (3) a free elastic sealing edge such that for at least one sealing edge on each side of the center line of the absorbent body, the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ .

The Office Action points out the reference in Roe to Dragoo and leg cuffs. Such reference, however, does not mean that the other teachings of Roe can be ignored. Clearly, leg cuffs are intended to prevent leakage, but the teachings of Roe regarding the use of lotion do not disclose the claimed invention just because the structure of the leg cuffs may be the same as in Dragoo. Roe makes clear that, although petrolatum may be used in the lotion taught therein, if such a material is used, the addition of a hydrophilic surfactant is required to obtain a sufficiently wettable lotion composition. *Column 21, lines 40-61*. This teaching is applicable to both the topsheet and any other placement of the lotion. Nothing in Roe discloses otherwise. Thus, petrolatum is not described for use alone and must be used in combination with other ingredients in the lotion composition of Roe to provide the desired hydrophilic qualities. Application of the lotion to any portion of the diaper is intended for the purpose disclosed. No other purpose is disclosed. Thus, none of the teachings of Roe disclose an absorbent article with the characteristics defined in claim 40.

Since Roe does not include each every element of claim 40, Roe does not anticipate this claim. Accordingly, it is respectfully requested that the Board reverse this rejection of claim 40.

**(k) Claims 41-42**

Claim 41 is dependent on claim 29 and is directed to an article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above the line  $y = kx + m$  within the major part of an available elongation range of 15-50%. Claim 42 is dependent on claim 41 and defines an article wherein the available elongation range is 10-60%.

The Office Action does not provide any basis for the rejections of claims 41 and 42. Claim 41 is directed to an absorbent article with the characteristics of the article of claim 29 except that the available elongation



range is 15-50%. Claim 42 is directed to an available elongation range of 10-60%.

Claims 41-42 are separately patentable and each further includes an additional feature which distinguishes over Roe. Roe does not disclose at least (1) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$  or (2) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$  within the major part of an available elongation range of 15-50% or 10-60%, respectively.

Roe does not disclose any information with regard to the available elongation or stretch which can be used when considering the extent to which a liquid barrier is stretched. Such disclosure is not included in Roe since Roe is directed to a lotion composition for application to prevent the adherence of BM, not to liquid barriers to prevent leakage. In view of the lack of basis for this rejection and the lack of disclosure of each feature of claims 41 and 42 in Roe, the cited patent does not anticipate the invention as defined therein. Accordingly, it is respectfully requested that the Board reverse this rejection of claims 41-42.

**2. Claims 15, 25-36 and 40-42 Would Not Have Been Obvious Under 35 U.S.C. § 103(a) Over Roe**

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. *MPEP § 2143*. Thus, to support a conclusion of obviousness, the prior art must suggest the desirability of making the claimed invention, i.e., provide a teaching or suggestion to one of ordinary skill in the art to have made the changes that would have produced the claimed subject matter. *Ryco Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). These requirements have not been met.

(a) **Claim 15**

Claim 15 would not have been obvious to one of skill in the art at the time the invention was made as Roe fails to suggest a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer, or of modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for a sealing edge to increase.

Roe is specifically directed to an absorbent article which has a topsheet of hydrophilic material or material treated to be hydrophilic to promote rapid transfer of liquids through the topsheet. *Column 7, lines 51-56; column 21, lines 40-42.* Roe further states:

Similarly, it is important that the lotion composition also be sufficiently wettable to ensure that liquids will transfer through the topsheet more rapidly. This diminishes the likelihood that body exudates will flow off the lotion coating rather than being drawn through the topsheet and being absorbed by the absorbent core. Depending upon the particular immobilizing agent used in the lotion composition of the present invention, an additional hydrophilic surfactant (or a mixture of hydrophilic surfactants) may, or may not, be required to improve wettability...Similarly, a hydrophobic emollient such as petrolatum will require the addition of a hydrophilic surfactant.

*Column 21, lines 42-61 (emphasis added).* Thus, Roe requires that the lotion composition be sufficiently wettable, i.e., hydrophilic, in order to ensure that the topsheet or other portion of the absorbent article treated is or remains hydrophilic. This is in accordance with the Background of the Invention of Roe which sets forth problems with previous hydrophobic materials used in absorbent products such as mineral oil or liquid petrolatum. *Column 1, lines 45-67.* According to Roe, among other problems, these materials result in slow transfer of urine to underlying absorbent cores. *Column 2, lines 39-45.* This problem is remedied by the hydrophilic topsheet and lotion combination of Roe which further prevents the adherence of BM to the skin. Thus, Roe teaches away from the hydrophobic materials used in the prior art. Rather, Roe requires the use of a wettable lotion which would not increase the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for the sealing edge as defined in claim 15. Rather, such a lotion would likely decrease the absolute value, the opposite of the intended effect.

As described in Appellants' specification, the capillary pressure of the pores in porous structures can be calculated with the Laplace equation which provides that the capillary pressure is  $\Delta P = 2\gamma \cos\theta/r$  where  $\gamma$  is the surface tension of the liquid,  $\theta$  is the wetting angle of the liquid to the material in the capillary walls, and  $r$  is the radius of the capillary. When  $\theta$  is greater than  $90^\circ$ ,  $\cos\theta$  is negative and  $\Delta P$  is consequently also negative. The capillary wall is hydrophobic and the resultant pressure  $\Delta P$  can be said to describe the breakthrough pressure, i.e., the maximum pressure a capillary or pore can withstand. When  $\theta$  is less than  $90^\circ$ , the capillary wall is hydrophilic and  $\Delta P$  and  $\cos\theta$  are positive. Liquid is then sucked into the pores. *Page 9, lines 15-25*. Since Roe is directed to a wettable lotion for use with a hydrophilic topsheet or other portion of a diaper, the lotion of Roe will result in the opposite effect from that defined in claim 15; thus, Roe teaches away from the invention defined in claim 15.

In the Office Action mailed December 2, 2003, the Examiner's position on the Appellants' prior arguments is set forth. Each of these statements is dealt with hereinafter in turn.

First, the Examiner argues that "Roe discloses the use of petrolatum on the leg gathers, which according to page 15 of the applicant's specification, is one way to reduce pore radius and increase the wetting angle." This statement is incorrect. Roe discloses the use of petrolatum as an emollient in the lotion composition disclosed. *See, column 15, lines 47-61*. The lotion composition of Roe comprises an emollient, a solid polyol polyester immobilizing agent, optionally a hydrophilic surfactant and other optional components, not an emollient by itself, such as petrolatum. *Column 10, lines 34-38*. Moreover, Roe does not specifically disclose the use of petrolatum on the leg gathers. As noted, petrolatum is one emollient that may be used in the lotion composition of Roe. The lotion composition may be used on any part of the diaper including the leg cuffs. *Column 25, lines 25-32*.

Second, the Office Action states "Roe discloses that it is highly desirable (not mandatory) that the diaper topsheel (emphasis added) is made of hydrophilic material to promote rapid transfer of liquids through the topsheet (col. 21, lines 40-42). However, Roe also discloses a hydrophobic topsheet that may be used with the invention (col. 5, lines 254 [sic] – 35)." This section of Roe actually describes the topsheet as follows:

The topsheet is preferably compliant, soft feeling, and non-irritating to the wearer's skin. Further, the topsheet is **liquid pervious**, permitting liquids (e.g., menses and/or urine) to readily penetrate through its thickness. A suitable topsheet may be manufactured from a wide range of materials such as woven and nonwoven materials (e.g., a nonwoven web of fibers); polymeric materials such as apertured formed thermoplastic films, apertured plastic films, and hydroformed thermoplastic films; porous foams; reticulated foams; reticulated thermoplastic films; and thermoplastic scrims. Suitable woven and nonwoven materials can be comprised of natural fibers (e.g., wood or cotton fibers), synthetic fibers (e.g., polymeric fibers such as polyester, polypropylene, or polyethylene fibers) or from a combination of natural and synthetic fibers. When the topsheet comprises a nonwoven web, the web may be manufactured by a wide number of known techniques. For example, the web may be spunbonded, carded, wet-laid, melt-blown, hydroentangled, combinations of the above, or the like.

*Column 5, lines 21-39* (emphasis added). Thus, this section referred to in the Office Action does not state that the topsheet may be hydrophobic. Rather, in another portion of Roe, the patent states as follows:

The topsheet 520 of diaper 50 is preferably made of a hydrophilic material to promote rapid transfer of liquids (e.g., urine) through the topsheet. If the topsheet is made of a hydrophobic material, at least the upper surface of the topsheet is treated to be hydrophilic so that liquids will transfer through the topsheet more rapidly. This diminishes the likelihood that body exudates will flow off the topsheet rather than being drawn through the topsheet and being absorbed by the absorbent core. The topsheet can be rendered hydrophilic by treating it with a surfactant.

*Column 7, lines 51-60.*

Thus, although a hydrophobic topsheet is not prohibited for use of such a topsheet, Roe requires that at least the upper surface must be treated to be hydrophilic.

Next, according to the Office Action:

...Roe explains that depending upon the immobilizing agent that is used, an additional hydrophilic surfactant may or may not be required (col. 21, lines 48-52). Roe also discloses that when the lotion composition is applied to diaper **topsheets** (emphasis added) immobilizing agents having HLB values below 7 will require the addition of a hydrophilic surfactant. Roe also states that the use of petrolatum will also require the addition of a hydrophilic surfactant. The examiner contends that Roe discloses the use of the hydrophilic surfactant with the petrolatum with respect to its use in the diaper topsheet. The use of the lotion with respect to the leg cuffs (col. 25,

lines 26-32) does not require the use of the optional hydrophilic surfactant.

*Office Action mailed December 2, 2003, page 5.*

Nothing in Roe indicates that the above cited description of the various lotion materials and the need for those materials to be wettable does not apply when the lotion is applied to a portion of the diaper other than the topsheet. Moreover, the Examiner's interpretation of Roe completely ignores the teachings of Roe which describe a "lotion composition" which contains an emollient and a solid polyol polyester immobilizing agent, and optionally a hydrophilic surfactant and other optional components. Nowhere in Roe is there a disclosure or suggestion that petrolatum or any other described emollient is used alone. Nowhere in Roe is there a disclosure or suggestion that the lotion composition will have varying properties from those specifically described. Such a reading of Roe completely ignores the teachings regarding hydrophilicity and wettability as well as the lotion composition aspect of Roe.

A cited reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Throughout Roe, the teachings indicate that hydrophilicity and/or wettability is desirable and required due to the nature of the invention, which is to promote rapid transfer of liquids through the topsheet. A careful review of the entire Roe document bears out this interpretation.

As noted, in the background of the invention of Roe, the problem of preventing BM from adhering to the wearer's skin and attempts to solve that problem are presented. Roe specifically describes problems created when hydrophobic materials such as mineral oil were used. *Column 1, lines 46-67*. Roe additionally discusses a particular patent, stating that a "major disadvantage of the diapers disclosed in the Duncan et al. reference is that the hydrophobic and oleophobic topsheets are slow in promoting transfer of urine to the underlying absorbent cores." *Column 2, lines 39-45*.

Moreover, Roe goes on to repeatedly state that a hydrophilic topsheet is provided or desired or that hydrophobic characteristics are unwanted. *See, for example, column 2, lines 46-49, lines 50-51; column 3, line 13; column 7, lines 51-67; column 18, lines 12-16; column 21, lines 39-61; column 23, lines 14-24; and*

*column 24, lines 8-12.* The contention of the Examiner that all of these teachings are irrelevant to the description of Roe allowing for the lotion to be placed on portions of the diaper besides the topsheet is clearly misplaced. The Examiner notes that to render leg cuffs hydrophilic would teach away from the basic principle of the leg cuff to prevent leakage. *Office Action mailed December 2, 2003.* However, the purpose of Roe is to prevent the adherence of BM. Roe does not discuss or suggest any use of the lotion provided to prevent leakage. In the basic description of leg cuffs provided, Roe notes that such are for containment of liquids and other body exudates. *Column 8, lines 36-38.* However, such acknowledgement of the use of a leg cuff does not equate to a disclosure or suggestion that the lotion of Roe be used differently with respect to any portion of the diaper, including the leg cuffs, than as taught throughout the remainder of the Roe patent. Such a change would require a substantial change in the basic principles set forth in Roe. This is impermissible hindsight reconstruction. *See, for example, In re Ratti, 123 USPQ 349 (CCPA 1959).*

Roe does not provide a suggestion or motivation to set aside every teaching presented regarding hydrophilicity and wettability, further set aside the stated intent of preventing the adherence of BM and completely change the lotion as described only for use on leg cuffs so as to solve a completely different problem.

The Office Action additionally states that even if Roe does teach the addition of a surfactant when using petrolatum, Roe also discloses the addition of the surfactant at amounts as low as 0.1% which are unlikely to affect the increase in the liquid-skin wetting angle caused by the addition of petrolatum to the skin. *Office Action mailed December 2, 2003, page 5.* However, Roe actually states that the amount of hydrophilic surfactant required to increase the wettability of the lotion composition to a desired level will depend upon the HLB value and level of immobilizing agent used, the HLB value of the surfactant used and like factors. *Column 23, lines 14-18.* Roe also states that the lotion composition can comprise from about 1 to about 50% of the hydrophilic surfactant when needed to increase the wettability properties of the composition. *Column 23, lines 18-20.* It is more likely from these teachings that a higher amount of surfactant would be used with petrolatum as the emollient in view of the teachings regarding wettability than that a low amount would be used as suggested in the Office Action.

One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. *In re Fine*, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988). Here, the rationale of the Office Action not only requires picking and choosing certain portions of Roe but also improperly modifying or changing the teachings as set forth therein without suggestion or motivation as required. Thus, Roe does not meet the first requirement of a *prima facie* case of obviousness.

The second requirement of a *prima facie* case of obviousness requires an expectation of success. One of skill in the art reviewing Roe would have been taught how to prevent the adherence of BM on the skin. However, claim 15 is directed to a method of achieving in an absorbent article an improved sealing ability against the skin of the wearer. In view of the teachings of Roe which emphasize hydrophilicity and wettability of the lotion composition described, one of skill in the art would not have been successful in using such a lotion composition to solve a problem relating to leakage. The use of a lotion composition as described in Roe would fail to provide improved sealing ability since the lotion composition of Roe would not function as required by the invention as defined in claim 15.

The third element for establishing *prima facie* obviousness of a claimed invention requires that all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Certainly, Roe does not include all of the features of rejected claim 15.

As described above and in the specification, an improvement to the sealing effect of the liquid barrier in an absorbent article against the wearer's skin may be made by influencing  $|\Delta P|$ , i.e.,  $|2\gamma \cos\theta m/r|$ , of the barrier so that this value increases. Such features are not described or suggested by Roe. The mere fact that Roe mentions a material disclosed in an example of the present application which material is effective for reducing the pore radius and increasing the wetting angle of the liquid to the skin (*page 15, lines 25-28*), does not mean Roe includes each feature defined in claim 15 where Roe teaches that the material is used in a completely different way (in a lotion composition) to cause a completely different effect (reduce adherence of BM). Thus, as discussed herein, the disclosure of Roe lacks several of the features of claim 15.

In view of the complete lack of disclosure or suggestion in Roe of the invention as defined by claim 15, a *prima facie* case has not been presented and Roe would not have made the invention as defined in claim 15 obvious to one of skill in the art. Accordingly, it is respectfully requested that the Board reverse this rejection of claim 15.

**(b) Claim 25**

Claim 25 is directed to the method according to claim 15 comprising causing the absolute value of  $\cos\theta_m$  to increase. The Office Action of December 2, 2003, does not specifically cite portions of the cited art which set forth each element of claim 25. Rather, the Examiner cites only to the rejection of claim 15. As discussed at length above, a *prima facie* case of obviousness with regard to claim 15 has not been made. Likewise, a *prima facie* case of obviousness with regard to claim 25 has not been made. Moreover, claim 25 is separately patentable and includes an additional feature not described or suggested by Roe.

Roe provides a lotion composition which may be applied to diapers to reduce the adherence of BM to the skin. The invention defined in claim 25 is directed to a method of achieving an improved sealing ability by causing the absolute value of  $\cos\theta_m$  to increase.

The present invention involves a method of improving the sealing ability of an absorbent article by causing the product  $2\gamma \cos\theta_m/r$  of one or more of the liquid barriers of the article to increase. *Page 13, lines 6-8*. The product can be increased by, for instance, influencing the wetting angle between the liquid to be sucked up and the skin or the barrier material, respectively; influencing the pore radius; and influencing both wetting angle and pore radius. *Page 13, lines 10-15*. Because the effect intended is to increase the absolute value of the product  $2\gamma \cos\theta_m/r$ ,  $|\cos\theta_m|$  may be increased to obtain the desired effect. *Page 13, lines 17-20*. Roe does not disclose or suggest such a effect or how to obtain any improvement in sealing ability.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). The features of claim 25 are not found in the Roe patent. Accordingly, the present invention as defined in claim 25 is nonobvious in



view of Roe and it is respectfully requested that the Board reverse this rejection of claim 25.

**(c) Claim 26**

Claim 26 is directed to the method according to claim 25, comprising treating the sealing edge such that a higher wetting angle of the liquid to the sealing edge comprising the pore wall will be obtained and/or such that a higher wetting angle of the liquid to the skin of the wearer will be obtained within those regions in which the sealing edge lies against the skin when the absorbent article is donned.

As discussed at length above, a *prima facie* case of obviousness with regard to claim 15 has not been made. Likewise, a *prima facie* case of obviousness with regard to claim 26 has not been made. Moreover, claim 26 is separately patentable and includes an additional feature not described or suggested by Roe.

Nothing in Roe would have led one of skill in the art to a method wherein the sealing edge is treated to obtain a higher wetting angle. Roe is directed to a lotion composition which reduces the adherence of BM to the skin of the wearer, thereby improving the ease of BM clean up and enhancing skin softness. Although Roe mentions applying its lotion composition to other portions of the diaper besides the topsheet, Roe does not disclose or suggest treating a sealing edge; in particular, there is no teaching or suggestion to obtain a higher wetting angle for improved sealing ability. Rather, application of the lotion composition of Roe would result in the opposite effect, since Roe emphasizes the need for hydrophilicity and wettability in the lotion composition and the materials to which it is applied. Accordingly, the present invention as described in claim 26 is nonobvious in view of Roe and it is respectfully requested that the Board reverse this rejection of claim 26.

**(d) Claim 27**

Claim 27 defines a method according to claim 15, comprising providing the sealing edge with a layer of material that increases the absolute value of  $\cos\theta_m$  and/or that reduces  $r$  when the article is donned.

As discussed at length above, a *prima facie* case of obviousness with regard to claim 15 has not been made. Likewise, a *prima facie* case of obviousness with regard to claim 27 has not been made. Moreover, claim 27 is separately patentable and includes an additional feature not described or suggested by Roe.

Nothing in Roe would have led one of skill in the art to a method wherein the sealing edge is treated to increase the absolute value of  $\cos\theta_m$  and/or reduce  $r$ . Roe is directed to a lotion composition which reduces the adherence of BM to the skin of the wearer, thereby improving the ease of BM clean up and enhancing skin softness. Although Roe mentions applying its lotion composition to other portions of the diaper besides the topsheet, Roe does not disclose or suggest treating a sealing edge; in particular, there is no teaching or suggestion to apply a layer of material for improved sealing ability. Rather, application of the lotion composition of Roe would result in the opposite effect, since Roe emphasizes the need for hydrophilicity and wettability in the lotion composition and the materials to which it is applied.

Accordingly, the present invention as described in claim 27 is nonobvious in view of Roe and it is respectfully requested that the Board reverse this rejection of claim 27.

**(e) Claim 28**

Claim 28 relates to the method according to claim 15 comprising causing the absolute value of  $\cos\theta_m/r$  to increase.

As discussed at length above, a *prima facie* case of obviousness with regard to claim 15 has not been made. Likewise, a *prima facie* case of obviousness with regard to claim 28 has not been made. Moreover, claim 28 is separately patentable and includes an additional feature not described or suggested by Roe.

Nothing in Roe would have led one of skill in the art to a method wherein the absolute value of  $\cos\theta_m/r$  is increased. Roe is directed to a lotion composition which reduces the adherence of BM to the skin of the wearer, thereby improving the ease of BM clean up and enhancing skin softness. Although Roe mentions applying its lotion composition to other portions of the diaper besides the topsheet, Roe does not disclose or suggest manipulating the claimed equation by causing the absolute value of  $\cos\theta_m/r$  to increase for

improved sealing ability. Rather, application of the lotion composition of Roe would result in the opposite effect, since Roe emphasizes the need for hydrophilicity and wettability in the lotion composition and the materials to which it is applied.

Accordingly, the present invention as described in claim 28 is nonobvious in view of Roe and it is respectfully requested that the Board reverse this rejection of claim 28.

**(f) Claim 29**

Roe does not disclose or suggest the invention as defined in claim 29 and, thus, claim 29 would not have been made obvious thereby. There are several features in claim 29 that are not described or suggested in Roe. Roe does not disclose at least (1) an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ , (2) within the major part of an available elongation range of between 20 and 40%. These properties would not have been made obvious by Roe since Roe does not disclose or suggest any absorbent article wherein on at least one sealing edge on each side of the center line of the absorbent body the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ .

The Office Action apparently relies only on two portions of Roe to find the invention defined in claim 29 obvious. First, the Office Action relies on the possible use of petrolatum as an emollient in the lotion composition of Roe. Second, the Office Action relies on the mention that the lotion composition may be used on the leg cuffs of a diaper. These teachings are woefully inadequate to lead to the invention as defined in claim 29.

One of skill in the art would not review the teachings of Roe for information regarding leakage issues. Even if one of skill in the art decided to use the lotion composition of Roe on leg cuffs, the lotion composition would be prepared according to the teachings of Roe, which require and suggest only lotion compositions which improve wettability. Motivation or suggestion to modify the lotion compositions of Roe to obtain improved sealing properties is completely lacking. According to the Office Action, such motivation is found in the principle of the leg cuff to prevent leakage. However, the proposed modification cannot change the principle of operation of the reference cited.

Moreover, Roe does not include any teaching or suggestion that would provide one of skill in the art with information which would enable them to utilize the equation as defined in claim 29 to obtain an absorbent article as claimed since Roe does not include any teaching or suggestion regarding capillary pressure, wetting angle, breakthrough pressure or any other information which led Appellants, as set forth in the specification, to an absorbent article as claimed. Roe does not disclose or suggest an absorbent article with the claimed characteristics. As noted in the specification, an absorbent article with the characteristics defined in claim 29 has improved sealing properties against a user. Roe does not provide any information as to such properties and the lotion provided would not provide improved sealing as discussed above. In view thereof, there is no motivation in Roe to modify its teachings to obtain the claimed invention and therefore, the first requirement of a *prima facie* case has not been met.

The second requirement of a *prima facie* case requires an expectation of success. In view of the complete lack of teaching or suggestion of any absorbent article with a sealing edge as claimed, there could not possibly be an expectation of success that one of skill in the art could obtain an absorbent article as claimed from the teachings of Roe.

The third requirement of a *prima facie* case of obviousness is that the art teaches or suggests all of the claim limitations. As discussed in depth above, Roe does not deal with the characteristics of a sealing edge which meets the recitations of claim 29. In view thereof, Roe does not teach or suggest all of the claim limitations of claim 29. Accordingly, the present invention as described in claim 29 is nonobvious in view of Roe and it is respectfully requested that the Board reverse this rejection of claim 29.

**(g) Claims 30-34**

Claims 30-34 are directed to the article according to claim 29 wherein  $m$  equals 48, 51, 57, 63 or 69. The lines corresponding to the absorbent articles of claims 30-34 are shown in Figure 5c. These lines show the measured breakthrough pressure of the most effective liquid barrier known at the time of the invention, the Huggies standing gather barrier. As shown,

each of the lines relating to  $m$  equals 48, 51, 57, 63 or 69 has better breakthrough pressure than the best known gather barrier. Each of claims 30-34 is separately patentable over Roe in view of the advantages of the invention as defined in each of these claims as shown in Figure 5c.

Roe does not teach or suggest any absorbent article with properties as defined in claims 30-34 which provide the improvement in breakthrough pressure illustrated in Figure 5c. As described in the specification, the sealing effect of an article having a liquid barrier where the absolute value of the negative product  $2\gamma \cos\theta m/r$  lies above the line  $y = kx + m$  at least within the major part of an available elongation range of 20-40%, where  $x$  designates the available elongation or stretch,  $k$  has the value  $-14/30$  and  $m$  has the value 48, preferably 51, more preferably 57, and even more preferably 63 and particularly 69, will be substantially better than the sealing effect achieved with conventional articles of this nature. *Specification, page 16, lines 13-19.*

A leg cuff which may have a lotion composition according to the teachings of Roe would not have made the invention as defined in claims 30-34 obvious as there is a complete lack of suggestion of providing an absorbent article as claimed. Accordingly, the present invention as described in claims 30-34 is nonobvious in view of Roe and it is respectfully requested that the Board reverse this rejection of claims 30-34.

**(h) Claim 35**

Claim 35 is directed to the article according to claim 29 wherein the free sealing edge includes a layer of a material such that a higher wetting angle of the liquid to the sealing edge material will be obtained and/or such that a higher wetting angle of the liquid to the skin of the wearer will be obtained within those regions in which the sealing edge lies against the skin and where the material smears the skin when the absorbent article is donned. Claim 35 is separately patentable over Roe as Roe does not contain any teaching or suggestion regarding wetting angle.

Roe is directed to a lotion composition which reduces the adherence of BM to the skin of the wearer. Roe describes a variety of lotion materials and discusses repeatedly the need for maintaining the hydrophilicity of the

topsheet and the need for a hydrophilic surfactant to increase the wettability of the lotion. Roe does not disclose obtaining a wetting angle or including a layer of a material on the free sealing edge to obtain a higher wetting angle. In view thereof, Roe does not disclose or suggest the invention defined in claim 35.

Accordingly, the present invention as described in claim 35 is nonobvious in view of Roe and it is respectfully requested that the Board reverse this rejection of claim 35.

**(i) Claim 36**

Claim 36 is dependent on claim 29 and defines an article wherein the free elastic sealing edge is provided with a layer of a material which at least partly fills out the pores in the free sealing edge when the article is donned.

Claim 36 is separately patentable over Roe as Roe does not contain any teaching or suggestion regarding filling out the pores in the free sealing edge.

Roe is directed to a lotion composition which reduces the adherence of BM to the skin of the wearer. Roe describes a variety of lotion materials and discusses repeatedly the need for maintaining the hydrophilicity of the topsheet and the need for a hydrophilic surfactant to increase the wettability of the lotion. As discussed above, Roe does not disclose providing a layer of material on the free sealing edge of a diaper which at least partly fills out the pores in the free sealing edge. In view thereof, Roe does not disclose or suggest the invention defined in claim 36.

Accordingly, the present invention as described in claim 36 is nonobvious in view of Roe and it is respectfully requested that the Board reverse this rejection of claim 36.

**(j) Claim 40**

Claim 40 is dependent on claim 29 and defines an article wherein the free elastic sealing edge is comprised of a ribbon-like elastic film. Claim 40 is separately patentable over Roe as it is directed to an aspect not disclosed or suggested therein.

According to the Office Action, as to claim 40, Roe discloses an article wherein the sealing edge is comprised of a ribbon-like elastic film in column 8, lines 50-56, through the incorporation of Dragoo, U.S. Patent No. 4,795,454. However, as discussed above, Roe does not disclose or suggest an absorbent article as defined in claim 29. Moreover, there is no disclosure or suggestion in Dragoo or Roe to provide a free elastic sealing edge comprised of a ribbon-like elastic film in an absorbent article wherein at least one sealing edge on each side of the center line of the absorbent body has the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  which lies above a line  $y = kx + m$ .

Accordingly, the present invention as described in claim 40 is nonobvious in view of Roe and it is respectfully requested that the Board reverse this rejection of claim 40.

**(k) Claims 41-42**

Claim 41 is dependent on claim 29 and is directed to an article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above the line  $y = kx + m$  within the major part of an available elongation range of 15-50%. Claim 42 is dependent on claim 41 and defines an article wherein the available elongation range is 10-60%. Claims 41 and 42 are separately patentable as each includes a feature which would not have been obvious from Roe.

The Office Action does not provide any basis for the rejections of claims 41 and 42. Claim 41 is directed to an absorbent article with the characteristics of the article of claim 29 except that the available elongation range is 15-50%. Claim 42 is directed to an available elongation range of 10-60%.

Roe does not disclose any information with regard to the available elongation or stretch which can be used when considering the extent to which a liquid barrier is stretched. Such disclosure is not included in Roe since Roe is directed to a lotion composition for application to prevent the adherence of BM, not to liquid barriers to prevent leakage. In view of the lack of basis for this rejection and the lack of disclosure of each feature of claims 41 and 42 in Roe, the cited patent would not have made the invention defined by claims 41 and 42 obvious. Accordingly, the present invention as described in claims 41-

42 is nonobvious in view of Roe and it is respectfully requested that the Board reverse this rejection of claims 41-42.

**D. The Rejection of Claims 16-24 and 37-39 as Unpatentable Under 35 U.S.C. § 103(a) over Roe is Improper**

As noted above, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. *MPEP* § 2143. Thus, to support a conclusion of obviousness, the prior art must suggest the desirability of making the claimed invention, i.e., provide a teaching or suggestion to one of ordinary skill in the art to have made the changes that would have produced the claimed subject matter. *Ryco Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). These requirements have not been met.

According to the Office Action, with reference to claims 16-24, Roe discloses a method of applying petroleum jelly to the leg cuffs of an absorbent article, thereby increasing the absolute value of  $\Delta P$  and decreasing the pore radius. *Office Action mailed December 2, 2003, page 4*. This is incorrect. Roe discloses a lotion composition for reducing the adherence of BM to skin which lotion composition may include petroleum jelly as an emollient. The lotion composition in its entirety includes (1) an emollient to improve the lubricity of the solid polyol polyester(s); (2) a solid polyol polyester(s) immobilizing agent; (3) optionally a hydrophilic surfactant(s); and (4) other optional components. The lotion is preferably applied to a topsheet material which is hydrophilic but may be applied to other portions of the diaper. The petroleum jelly is in a composition which Roe teaches to be formulated to have wettability by use of a hydrophilic surfactant. *Column 23, lines 14-20*.

Further according to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to experiment with the amount of petroleum jelly in order to determine the most effective product since it has been held that discovering the optimum value of a result effective variable involves only routine skill in the art. However, experimentation with petroleum jelly is not suggested by Roe which only provides that such material may be used as an



emollient in a lotion composition which must include other materials. Thus, there is no teaching or suggestion as to how to adjust the lotion composition by experimentation with the petroleum jelly or how such experimentation would have led one of skill in the art to the invention defined by the rejected claims.

**1. Claim 16**

Claim 16 is directed to the method according to claim 15 comprising causing the absolute  $\Delta P$  to increase at least within a major part of an available elongation range of 20-40%.

As discussed at length above, an *prima facie* case of obviousness with regard to claim 15 has not been made. Likewise, a *prima facie* case of obviousness with regard to claim 16 has not been made. Claim 16 is separately patentable since it includes features not present in the cited art.

As discussed with respect to claim 15, Roe does not disclose or suggest any method of achieving improved sealing ability. Moreover, Roe does not disclose or suggest modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for said sealing edge to increase. Additionally, Roe does not disclose or suggest causing the absolute  $\Delta P$  to increase at least within a major part of an available elongation range of 20-40%.

Accordingly, it is respectfully requested that the Board reverse the rejection of claim 16.

**2. Claims 17-20**

Claims 17-20 are each dependent on claim 15. Claim 17 is a method comprising causing the absolute value of  $\Delta P$  to increase by at least 5%. Claim 18 is a method comprising causing the absolute value of  $\Delta P$  to increase by at least 15%. Claim 19 is a method comprising causing the absolute value of  $\Delta P$  to increase by at least 25%. Claim 20 is a method comprising causing the absolute value of  $\Delta P$  to increase by at least 35%. Claims 17-20 are each separately patentable since each of these claims includes features not present in the cited art.

As discussed with respect to claim 15, Roe does not disclose or suggest any method of achieving improved sealing ability. Moreover, Roe does not disclose or suggest modifying or treating the absorbent article in such a way as to cause the

absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for said sealing edge to increase. Additionally, Roe does not disclose or suggest causing the absolute value of  $\Delta P$  to increase by at least 5%, 15%, 25% or 35%, respectively.

Accordingly, it is respectfully requested that the Board reverse the rejection of claims 17-20.

**3. Claims 21-24**

Claims 21-24 are each dependent on claim 15. Claim 21 is a method comprising causing the pore radius of the sealing edge to decrease at least at an available elongation above 60%. Claim 22 is a method comprising causing the pore radius of the sealing edge to decrease at least at an available elongation above 50%. Claim 23 is a method comprising causing the pore radius of the sealing edge to decrease at least at an available elongation above 40%. Claim 24 is a method comprising causing the pore radius of the sealing edge to decrease at least at an available elongation above 20%. Claims 21-24 are each separately patentable since each of these claims includes features not present in the cited art.

As discussed with respect to claim 15, Roe does not disclose or suggest any method of achieving improved sealing ability. Moreover, Roe does not disclose or suggest modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  for said sealing edge to increase. Additionally, Roe does not disclose or suggest causing the pore radius of the sealing edge to decrease at least at an available elongation above 60%, above 50%, above 40% or above 20%, respectively.

Accordingly, it is respectfully requested that the Board reverse the rejection of claims 21-24.

**4. Claims 37-39**

Claim 37 is dependent on claim 29 and is directed to an absorbent article according to claim 29 wherein when the article is donned, the free elastic sealing edge has a pore radius which is essentially independent of the available elongation or stretch and which is at most 0.10 mm. Claim 38 is dependent on claim 37 and recites that the pore radius is at most 0.08 mm. Claim 39 is dependent on claim 37 and recites that the pore radius is at most 0.04 mm. Claims 37-39 are each

separately patentable since each of these claims includes features not present in the cited art.

According to the Office Action, the recitations of claims 37-39 would be an obvious matter of design choice that does not patentably distinguish the claimed invention from the prior art, absent a critical teaching and/or unexpected result. Appellants disagree.

Roe does not disclose or suggest at least an absorbent article wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ , within the major part of an available elongation range of between 20 and 40%, or an absorbent article wherein the pore radius is essentially independent of the available elongation or stretch and which is at most 0.10 mm, 0.08 mm or 0.04 mm, respectively. These properties would not have been made obvious by Roe since Roe does not discuss sealing effects, does not suggest any solution to leakage problems or disclose or suggest a material for use to obtain a sealing edge on each side of the center line of the absorbent body wherein the absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above a line  $y = kx + m$ .

Accordingly, it is respectfully requested that the Board reverse the rejection of claims 37-39.

#### IX. Conclusion

For at least the reasons set forth above, it is respectfully submitted that the rejections of claims 15-42 are improper and should be reversed.

Respectfully submitted,

Burns, Doane, Swecker & Mathis, L.L.P.

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By: Mary B. Grant  
Mary B. Grant  
Registration No. 32,176

P.O. Box 1404  
Alexandria, Virginia 22313-1404  
(919) 941-9240

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## **APPENDIX A**

### **The Appealed Claims**

15. A method of achieving in an absorbent article that includes (1) an absorbent body disposed between a liquid-impermeable bottom sheet which is intended to lie distal from a wearer in use, (2) a liquid-permeable upper sheet which is intended to lie proximal to the wearer, and (3) either a) at least one longitudinally extending liquid barrier on each side of a center line of the upper sheet made of essentially liquid-impermeable material and fastened along or adjacent to a respective longitudinally extending side extremity of the absorbent article and comprising a free elastic sealing edge intended to be stretched against the wearer, or b) above the upper sheet, a top liquid-impermeable sheet which is intended to lie against the wearer, includes elastic for shaping the article to the wearer's body, and includes apertures intended to lie in register with the anus and the urethra orifice of the wearer, around which apertures elastically puckered sealing edges are disposed in the top sheet,

an improved sealing ability against the skin of the wearer, at a given available elongation, by at least one sealing edge on each side of the center line, comprising modifying or treating the absorbent article in such a way as to cause the absolute value of  $\Delta P = 2\gamma \cos\theta_m / r$  for said sealing edge to increase, where  $\gamma$  designates the surface tension of a liquid to be absorbed by suction,  $r$  designates the radius of the largest circle that can be encompassed in any pore with walls formed by said sealing edge against the wearer's skin at the given available elongation, and  $\cos\theta_m$  is the weighted mean value of  $\cos\theta$ , where  $\theta$  is the wetting angle of the liquid to the sealing edge or the skin comprising the pore walls.

16. The method according to Claim 15, comprising causing said absolute value of  $\Delta P$  to increase at least within a major part of an available elongation range of 20-40%.

17. The method according to Claim 15, comprising causing said absolute value of  $\Delta P$  to increase by at least 5%.

18. The method of Claim 15, comprising causing said absolute value of  $\Delta P$  to increase by at least 15%.

19. The method of Claim 15, comprising causing said absolute value of  $\Delta P$  to increase by at least 25%.

20. The method of Claim 15, comprising causing said absolute value of  $\Delta P$  to increase by at least 35%.

21. A method according to Claim 15, comprising causing said pore radius of said sealing edge to decrease at least at an available elongation above 60%.

22. A method according to Claim 15, comprising causing said pore radius of said sealing edge to decrease at least at an available elongation above 50%.

23. A method according to Claim 15, comprising causing said pore radius of said sealing edge to decrease at least at an available elongation above 40%.

24. A method according to Claim 15, comprising causing said pore radius of said sealing edge to decrease at least at an available elongation above 20%.

25. The method according to Claim 15, comprising causing the absolute value of  $\cos\theta_m$  to increase.

26. The method according to Claim 25, comprising treating said sealing edge such that a higher wetting angle of the liquid to the sealing edge comprising the pore wall will be obtained and/or such that a higher wetting angle of the liquid to the skin of the wearer will be obtained within those regions in which said sealing edge lies against the skin when the absorbent article is donned.

27. The method according to Claim 15, comprising providing said sealing edge with a layer of material that increases the absolute value of  $\cos\theta_m$  and/or that reduces  $r$  when the article is donned.

28. The method according to Claim 15, comprising causing the absolute value of  $\cos\theta_m/r$  to increase.

29. An absorbent article that includes an absorbent body disposed between a liquid-impermeable bottom sheet which is intended to lie distal from a wearer in use, a liquid-permeable upper sheet which is intended to lie proximal to the wearer, and either 1) at least one longitudinally extending liquid barrier on each side of a center line of the upper sheet, made of essentially liquid-impervious material and fastened along or adjacent to a respective longitudinally extending side extremity of the article and including a free elastic sealing edge intended to be stretched against the wearer, or 2) above the upper sheet, a liquid-impermeable top sheet which is intended to lie against the wearer, includes elastic for shaping the article to the wearer's body, and includes apertures intended to lie in register with the anus and the urethra orifice of the wearer, around which apertures elastically puckered sealing edges are disposed in the top sheet where, in respect of at least one sealing edge on each side of the center line of said absorbent body, the absolute value of  $\Delta P = 2\gamma \cos\theta_m/r$  lies above a line  $y = kx + m$ , where  $x$  designates the available elongation of the sealing edge,  $k$  has the value  $-14/30$  and  $m$  has a value in the range of 48 to 69, within the major part of an available elongation range of between 20 and 40%, and where  $\gamma$  designates the surface tension of a liquid to be absorbed,  $r$  designates the radius of the largest circle that can be enclosed in any pore with walls formed by said sealing edge against the skin of the wearer at a given available elongation, and  $\cos\theta_m$  is the weighted value of  $\cos\theta$ , where  $\theta$  is the wetting angle of the liquid to the sealing edge or the skin comprising the pore walls.

30. The article according to Claim 29, wherein  $m$  equals 48.

31. The article according to Claim 29, wherein m equals 51.

32. The article according to Claim 29, wherein m equals 57.

33. The article according to Claim 29, wherein m equals 63.

34. The article according to Claim 29, wherein m equals 69.

35. The article according to Claim 29, wherein said free sealing edge includes a layer of a material such that a higher wetting angle of the liquid to the sealing edge material will be obtained and/or such that a higher wetting angle of the liquid to the skin of the wearer will be obtained within those regions in which said sealing edge lies against the skin and where said material smears the skin when the absorbent article is donned.

36. The article according to Claim 29, wherein said free elastic sealing edge is provided with a layer of a material which at least partly fills out the pores in said free sealing edge when the article is donned.

37. The article according to Claim 29, wherein, when the article is donned, said free elastic sealing edge has a pore radius which is essentially independent of the available elongation or stretch and which is at most 0.10 mm.

38. The article according to Claim 37, wherein the pore radius is at most 0.08 mm.

39. The article according to Claim 37, wherein the pore radius is at most 0.04 mm.

40. The article according to Claim 29, wherein said free elastic sealing edge is comprised of a ribbon-like elastic film.

41. The article according to Claim 29, wherein said absolute value of  $\Delta P = 2\gamma \cos\theta m/r$  lies above the line  $y = kx + m$  within the major part of an available elongation range of 15-50%.

42. The article according to Claim 41, wherein the available elongation range is 10-60%.